U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
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TO ALL BILLFISHERS:

For 15 years the National Marine Fisheries Service (NMFS) and the Hawaiian International Billfish Tournament (HIBT) have cooperated in the collection and dissemination of scientific information at the tournament. HIBT officials institute and arrange tournament procedures, and provide equipment and supplies to make it possible for NMFS observers to gather data. Both organizations cooperate to make HIBT an educational as well as an enjoyable experience by providing demonstrations, workshops, lectures, projects, and exhibits on game fish oriented science. NMFS analyzes the tournament data and issues a current report of each tournament. This is the report for the Eighteenth HIBT. NMFS also stores the data to be reviewed and analyzed periodically from a more encompassing perspective.

A special visiting biologist from New Zealand, Peter Saul, joined the science team of Ray Sumida and myself. Peter was sponsored by the New Zealand Game Fish Council to familiarize himself with ongoing research on billfishes.

The accomplishment of our work at the tournament depended on the cooperation and the assistance of anglers, the tournament staff and officials, and the volunteers from the community. The three of us thank you for your generous support which not only made it possible for us to do our work but made it enjoyable as well.

THE CATCH

This year the catch consisted of 47 blue marlin, 1 black marlin, 3 striped marlin, 5 shortbill spearfish, and 32 ahi (yellowfin tuna). Table 1 lists the catches at HIBT since 1962. From the number of boat-days per fish (extreme right column of Table 1) one can see that this year's fishing was the least efficient since 1969, which is the last year before tournaments were scheduled to coincide with the new moon.

It also equals the best year (1967) prior to 1970, the first year that HIBT has been scheduled to coincide with the new moon.

What the blue marlin lacked in numbers, especially when compared to the past two extraordinary years (1974-75), they made up for it in size. The average weight of the blue marlin landed was 313 lb. Their average weight in 1975 was 207 lb. The weight range of the blue marlin was 84-745 lb and half of them weighed in more than 274 lb. Seven blue marlin weighed over 500 lb. At no other HIBT have so many fish weighing over 500 lb been caught.

TACKLE, TIDES, AND TIME

The percentage of fish landed on 80-lb test line was 63.6% this year. This is the highest percentage landed on 80-lb test since 1970 (Figure 2). Of the rest of the fish 31.8% were caught on 50-lb test line and 4.6% were caught on 130-lb test line. The percentage of hook-ups landed increased to 58%, the highest to date (Figure 2). I would like to interpret this statistic as meaning that your fishing skills have improved but at this point I don't have sufficient data to show that it is not within the range of chance fluctuations.

I think it would be interesting to determine the fishing effectiveness of lines of various strengths. That determination will have to wait for another day, however. We did not collect data for that analysis.

I continue to look for that elusive relationship between tide phase and fish availability. In Figure 3 the strike rates calculated from the radio reports are superimposed on the tide chart of the tournament period. No relationship is obvious. The fact that HIBT catches have improved outstandingly since the tournament has been scheduled to coincide with the new moon implies a relationship. Data of the past 6 years have been teasingly suggestive. And it still remains a puzzle.

Ahi catches were well distributed throughout the day. The blue marlin catches, on the other hand, showed a peak period during the 11-12 o'clock hour (Figure 4). In 1975 the same hour was also the best for blue marlin. Moreover, except for the hour of 9-10 o'clock, the hourly distribution patterns of blue marlin catches for 1976 and 1975 (Figure 5) are strikingly similar. Coincidence?

STOMACH CONTENTS

Forty-six blue marlin were dissected and their stomachs examined. The results are listed in Table 5. The species of fish that occurred in more stomachs than any other species was the opelu. It was found in 14 stomachs or 34% of the stomachs examined. Skipjack tuna occurred in 13 stomachs and was the most important food item in numbers and in bulk. Seventy-one percent of the blue marlin stomachs contained one or more species of tuna. Squid, another popular diet item, occurred in 24% of the stomachs.

Several stomachs had unusual items in them. One stomach contained two juvenile broadbill swordfish. One of the juveniles was 65 cm (26 in.) long; the other was too digested to be measured. A wahoo (ono) measuring 112 cm (44 in.) in length was in another stomach. The other unusual item was a 16-lb skipjack tuna. Although this species is one of the more common items in blue marlin stomachs, the largest ones are usually about 4 lb.

Table 1.--Numbers of qualifying game fish landed and teams fishing during Hawaiian International Billfish Tournaments, 1962-76.

Year	Blue marlin	Black marlin	Striped marlin	Shortbill spearfish	Sailfish	Yellowfin tuna ≥100 lb	Total qualifying fish	Number of teams	Number of boat-days fishing per fish[1]
1962	30	1	--	--	1	19	51	68	6.7
1963	19	2	1	--	--	26	48	72	7.5
1964	31	--	1	--	--	2	34	69	10.1
1965	47	--	--	--	--	9	56	78	6.9
1966	26	3	2	--	--	7	38	72	9.5
1967	63	--	1	--	--	18	82	68	4.2
1968	36	2	4	--	--	4	46	85	9.2
1969	32	1	--	--	--	4	37	75	10.1
1970	91	--	2	--	2	14	109	73	3.3
1971	41	--	3	1	--	47	92	77	3.4
1972	77	--	--	--	--	11	88	59	3.4
1973	76	--	1	3	1	17	98	61	3.1
1974	66	2	1	6	--	37	110	64	2.9
1975	104	--	2	8	--	79	193	79	2.0
1976	47	1	3	5	--	32	88	74	4.2

[1]Nine-hour fishing days, 1962-73; 8-hour days, 1974-76.

Table 3.--Number of fish caught by species, date, and area, HIBT 1976.

	Area													
	B	C	E	I	J	K	L	M	N_A	S	T	U_A	U_B	V
Blue marlin														
July 26	—	—	—	—	—	3	—	—	—	—	3	1	1	1
27	—	—	—	—	1	2	1	—	—	2	—	1	1	—
28	—	—	—	—	—	1	2	—	—	2	2	—	—	—
29	—	—	—	1	1	1	4	—	—	1	—	1	—	—
30	—	1	—	1	1	4	2	—	—	3	1	1	—	—
Sum		1		2	3	11	9			8	6	4	2	1
Avg. weight (lb)		168.0		378.0	363.7	323.6	308.3			236.6	297.3	332.2	522.0	303.5
Ahi														
July 26	1	—	—	—	4	3	3	—	—	1	—	1	2	—
27	—	—	—	—	—	1	1	1	—	—	—	—	1	—
28	2	—	—	—	—	1	—	2	—	—	—	—	1	—
29	—	—	1	1	—	1	—	—	—	—	—	—	—	—
30	—	—	—	—	1	2	—	—	—	—	1	—	—	—
Sum	3		1	1	5	8	4	3		1	1	1	4	
Avg. weight (lb)	166.2		206.5	147.5	175.3	162.2	187.9	161.0		112.0	104.0	125.5	157.8	
Black marlin														
July 26	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Weight (lb)										232.0				
Striped marlin														
July 28	—	—	—	—	—	1	—	—	—	—	—	1	—	—
30	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Weight (lb)		75.0				41.0						57.5		
Shortbill spearfish														
July 27	—	—	—	—	—	1	1	—	—	—	—	—	—	—
29	—	—	—	—	—	1	—	—	1	—	1	—	—	—
Sum						2	1		1		1			
Avg. weight (lb)						43.0	33.0		38.0		31.5			

Table 5.--Stomach contents of blue marlin, HIBT 1976.

Food items	Date and number of stomachs containing listed food items					Percent occurrence
	July					
	26	27	28	29	30	
Fish						
Tunas and mackerels, Scombridae	7	5	4	4	9	71
Skipjack tuna, *Katsuwonus pelamis*	3	3	2	2	3	32
Kawakawa, *Euthynnus affinis*	-	-	1	1	-	5
Frigate mackerel, *Auxis* sp.	2	-	-	-	4	15
Ono (wahoo), *Acanthocybium solandri*	-	-	-	-	1	2
Unidentified tuna	3	2	2	1	6	34
Broadbill swordfish, Xiphiidae	1	-	-	-	-	2
Opelu, Carangidae	4	-	1	5	4	34
Mahimahi, Coryphaenidae	-	-	1	1	1	7
Triggerfish, Balistidae	1	1	-	-	-	5
Pelagic spiny puffer, Diodontidae	-	1	2	1	-	10
Sharpbacked puffer, Canthigasteridae	-	-	1	-	-	2
Butterflyfish, Chaetodontidae	-	-	2	2	-	10
Surgeonfish, Acanthuridae	-	-	1	1	-	5
Lancetfish, Alepisauridae	-	-	2	1	-	7
Aweoweo, Priacanthidae	-	-	-	1	-	2
Unidentified fish	3	2	-	2	4	27
Invertebrates						
Squid, Decapoda	4	2	1	1	2	24
Octopus, Octopoda	-	-	1	-	-	2
Empty or everted stomachs	1	3	1	2	2	20
Number of stomachs examined	9	8	7	8	14	
Total: 46						

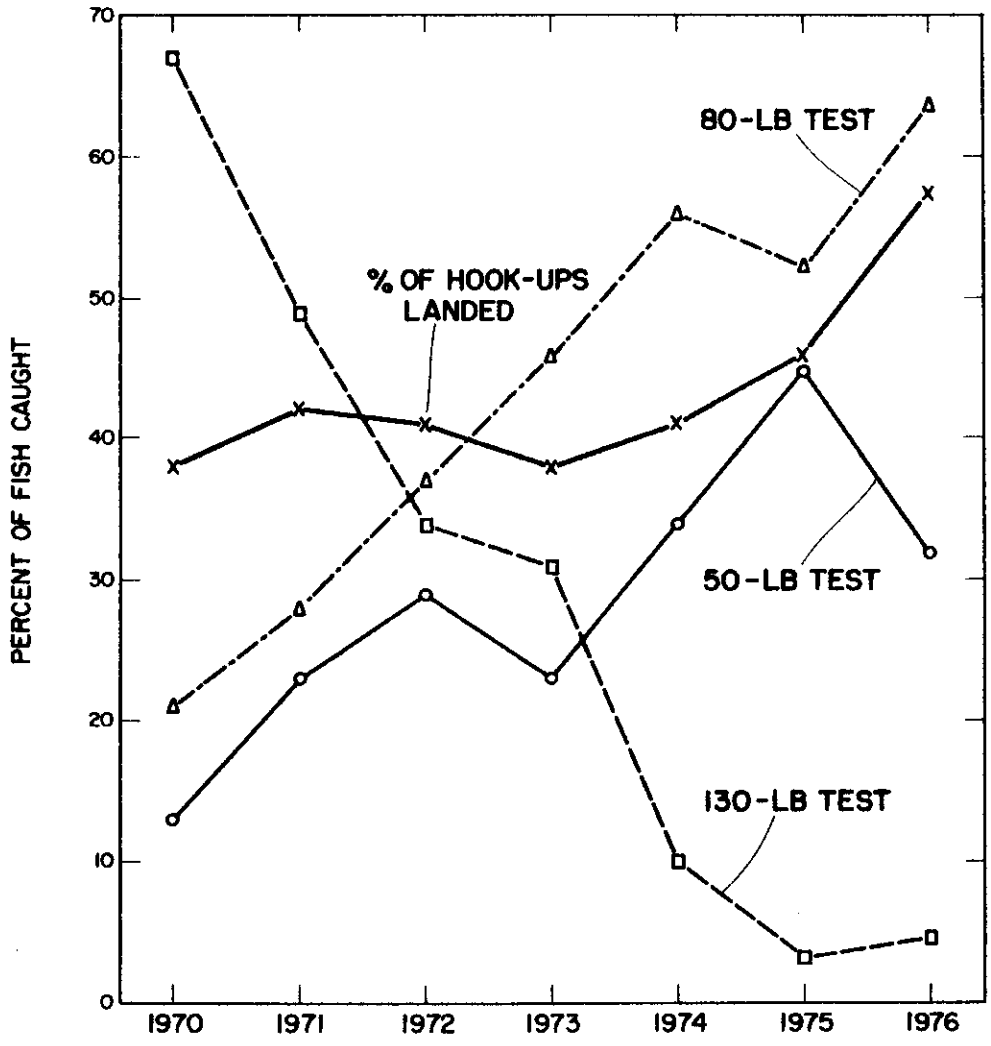

Figure 2.--Proportion of catch landed on lines of various sizes.

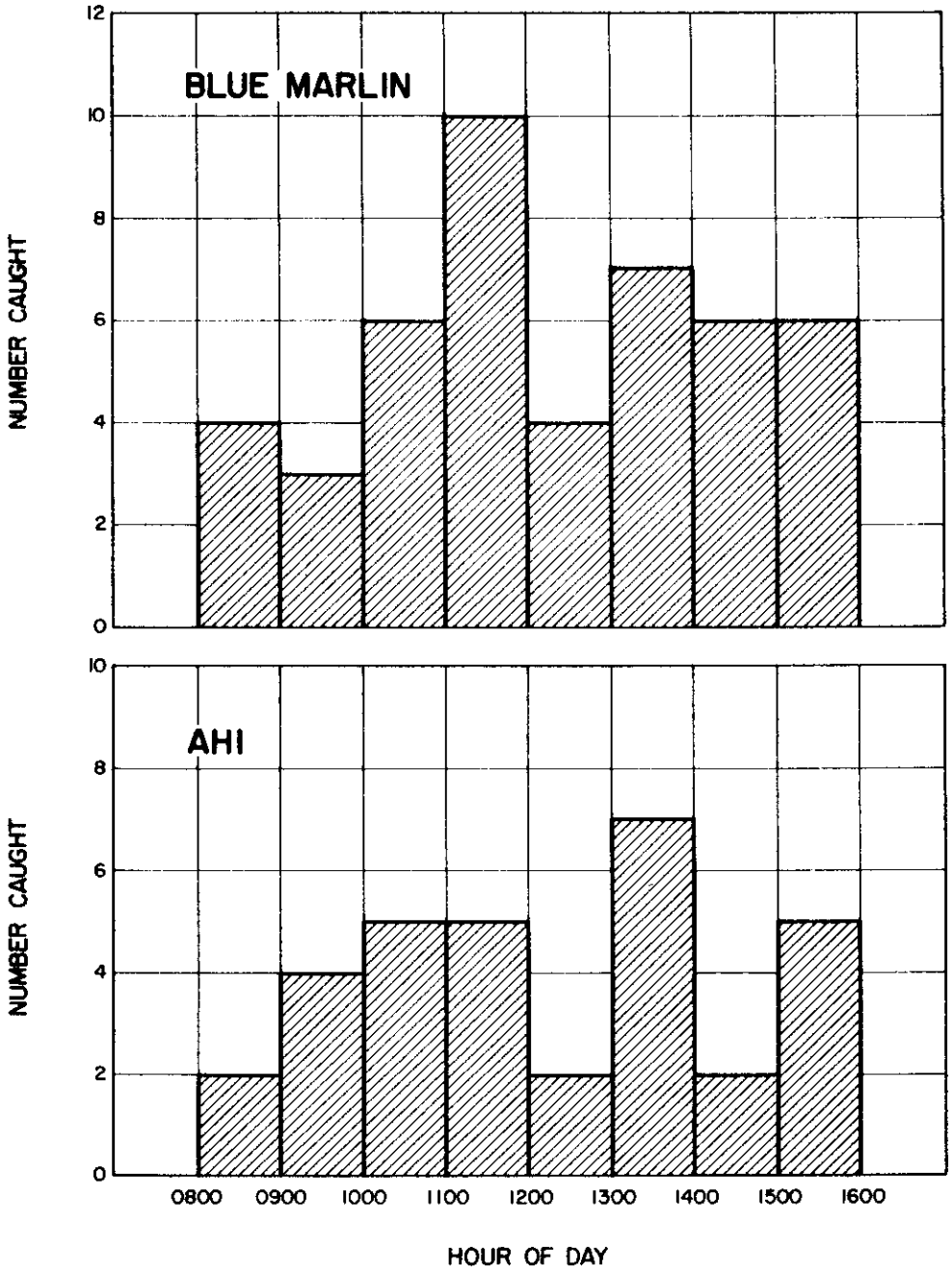

Figure 4.--Number caught and time of day for blue marlin and ahi.